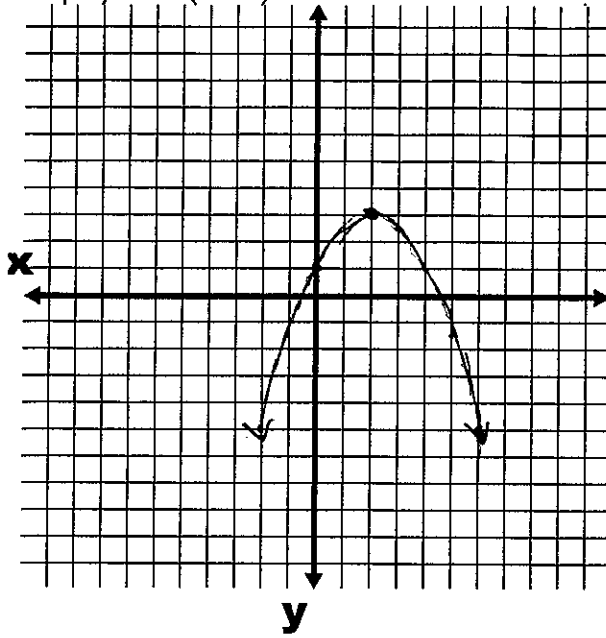


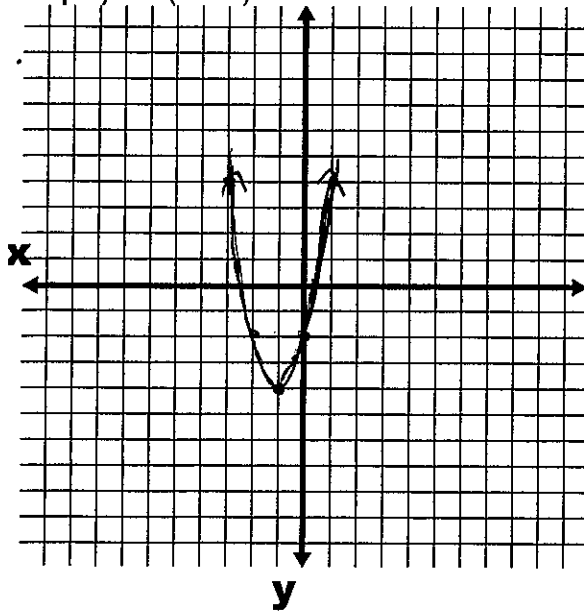
Name: _____
Date: _____

Graphing Quadratic Functions

1) Graph $y = -\frac{1}{2}(x - 2)^2 + 3$

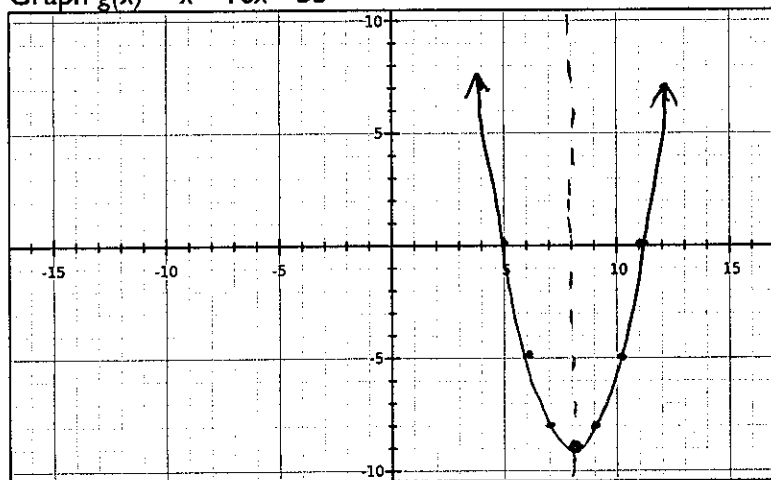


2) Graph $y = 2(x + 1)^2 - 4$



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3) Graph $g(x) = x^2 - 16x + 55$



$$x = \frac{-b}{2a}$$

$$x = \frac{16}{2}$$

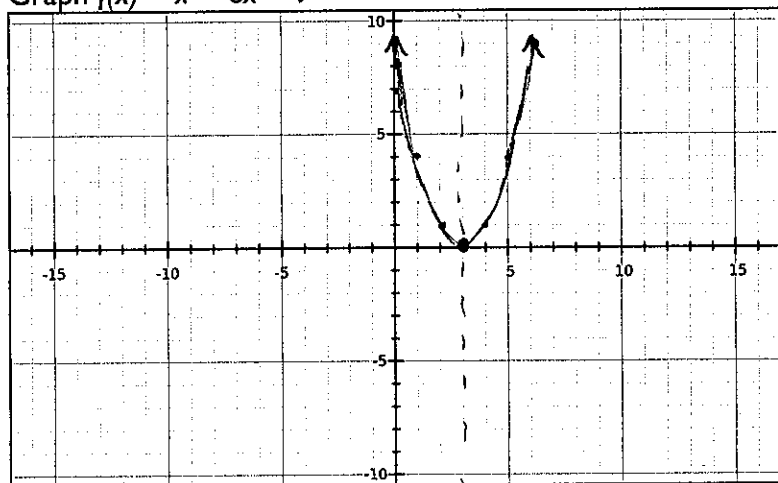
$$x = 8$$

$$y = (8)^2 - 16(8) + 55$$

$$y = -9$$

Vertex (8, -9)

4) Graph $f(x) = x^2 - 6x + 9$



$$x = \frac{-b}{2a}$$

$$x = \frac{6}{2}$$

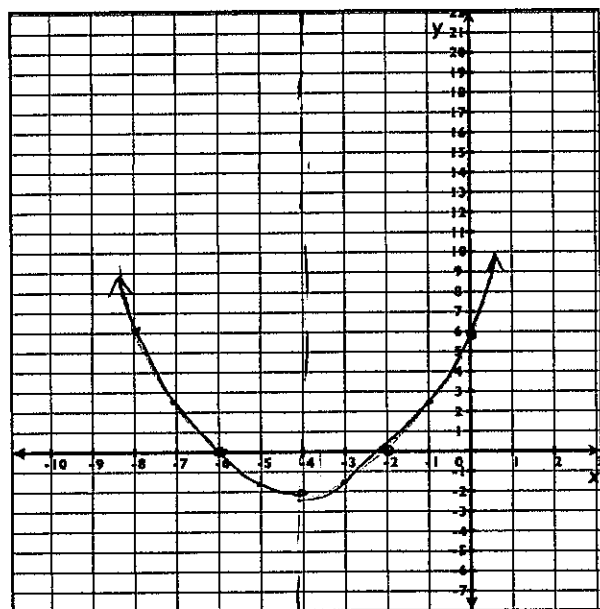
$$x = 3$$

$$y = (3)^2 - 6(3) + 9$$

$$y = 0$$

Vertex (3, 0)

5) Graph $f(x) = \frac{1}{2}(x+6)(x+2)$

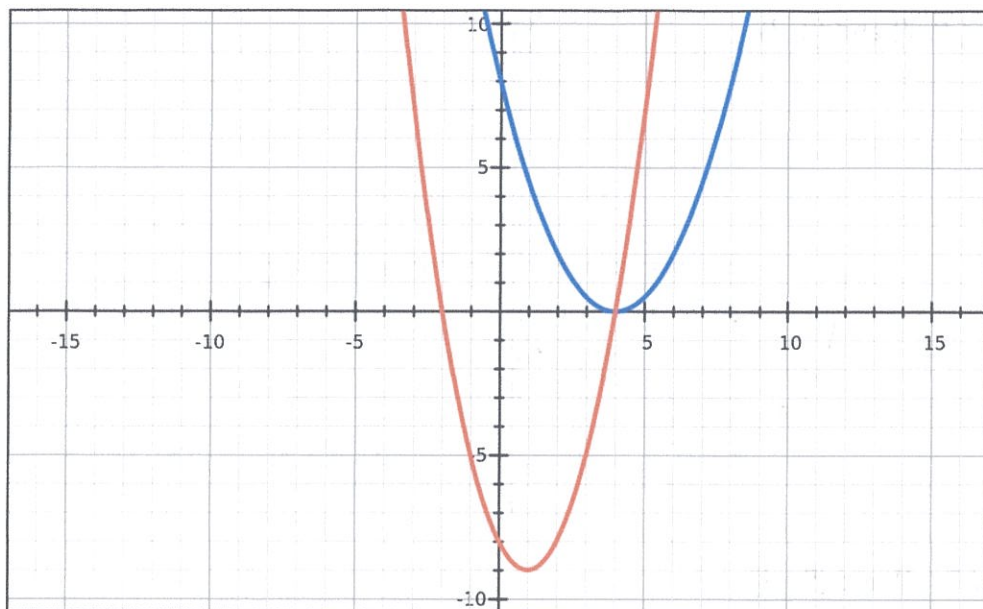


$$y = \frac{1}{2}(-4+6)(-4+2)$$

$$y = -2$$

Vertex (-4, -2)

Writing the Equations of Graph of Quadratic Functions



6) Write the equation for each function in **vertex**, **factored**, and **standard** form.

Red

$$f(x) = 1(x-1)^2 - 9 \quad \text{vertex form}$$

$$f(x) = 1(x-4)(x+1) \quad \text{factored}$$

$$f(x) = x^2 - 3x - 4 \quad \text{standard}$$

Blue

$$g(x) = \frac{1}{2}(x-4)^2 + 0 \quad \text{vertex}$$

$$g(x) = \frac{1}{2}(x-4)^2 \quad \text{factored}$$

$$\begin{aligned} g(x) &= \frac{1}{2}(x-4)(x-4) \\ &= \frac{1}{2}(x^2 - 8x + 16) \end{aligned}$$

$$g(x) = \frac{1}{2}x^2 - 4x + 8 \quad \text{standard}$$

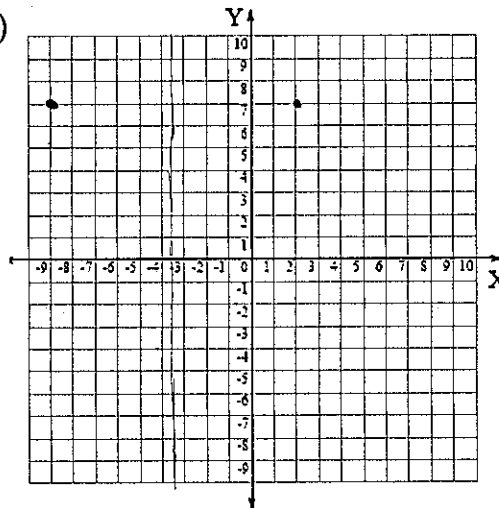
Hint: if you don't know "a", find the vertex, and substitute a point into vertex form to solve for "a"

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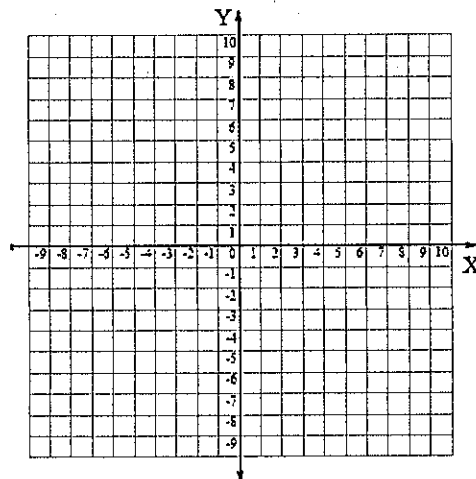
Graph and write the equation in vertex and standard form of each parabola.

7) two points on the parabola: $(-9, 7)$ and $(2, 7)$

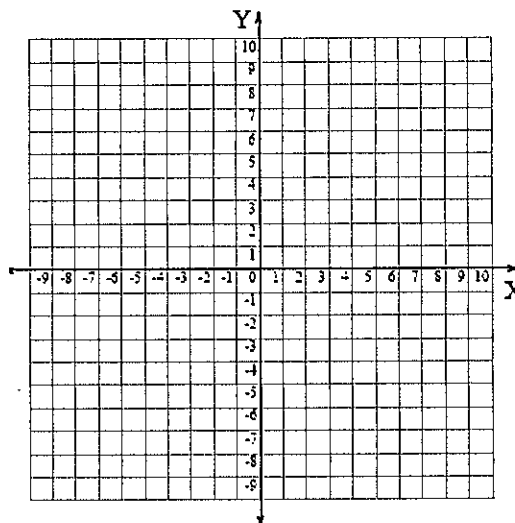
axis of symmetry: $x = -3\frac{1}{2}$
(halfway between
 -9 & 2)



8) two points on the parabola: $(-7, -4)$ and $(9, -4)$



9) two points on the parabola: $(3, 5)$ and $(0, \frac{1}{2})$



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Questions:

10) The three forms of quadratic functions are below. For each type, write the formula and tell how you would graph the function.

a. Standard form:

b. Vertex form:

c. Factored form:

11) What is the basic quadratic pattern that any quadratic function follows from the vertex to the next points? (Hint: over 1, up ?)

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Quadratic Patterns:

Find the equation of each pattern below:

12)

x	0	1	2	3	4	5
y	169	194	220	247	275	304

\swarrow +25 \swarrow +26 \swarrow +27 \swarrow +28 \swarrow +29

$$a = \frac{1}{2}$$

$$c = 169$$

$$247 = \frac{1}{2}(3)^2 + 3b + 169$$

$$247 = 4.5 + 3b + 169$$

$$73.5 = 3b$$

$$24.5 = b$$

$$y = \frac{1}{2}x^2 + 24\frac{1}{2}x + 169$$

13)

x	0	1	2	3	4	5
y	0	1.5	6	13.5	24	37.5

\swarrow +1.5 \swarrow +4.5 \swarrow +7.5 \swarrow +10.5 \swarrow +13.5

$$a = \frac{3}{4}$$

$$c = 0$$

$$6 = \frac{3}{4}(2)^2 + 2b + 0$$

$$6 = 3 + 2b$$

$$3 = 2b$$

$$1\frac{1}{2} = b$$

$$y = \frac{3}{4}x^2 + 1\frac{1}{2}x$$

14)

x	0	1	2	3	4	5
y	0	25	100	225	400	625

\swarrow +25 \swarrow +75 \swarrow +125 \swarrow +175 \swarrow +225

$$a = 25$$

$$c = 0$$

$$225 = 25(3)^2 + 3b + 0$$

$$225 = 225 + 3b$$

$$b = 0$$

$$y = 25x^2$$